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Sandia soars in atmosphere research

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LIVERMORE — A national scientific team led by Sandia/California National Laboratories has launched a new era of atmospheric research using high-flying robot airplanes, a lab project leader said Monday.

During a 2½ hour test flight last month, an awkward-looking, unmanned plane known as a Gnat climbed 22,700 feet above Edwards Air Force, taking a series of measurements of solar energy trapped in the atmosphere.

Although intended only as a test of scientific instruments, the flight fulfilled project scientists' hopes for real data, said aerospace engineer Will Bolton of Sandia's global change and remote sensing office.

"As far as I'm aware, this is the first time any one has made this kind of scientific measurement from a UAV (unmanned aerial vehicle)," he said.

The project, which has drawn together scientists from Sandia, NASA, various universities and other labs, including Lawrence Livermore Laboratory, began seven months ago. Its long-term aim is to provide government and university environmental scientists with new tools — in the form of scientifically equipped robot planes — for solving a major mystery in climatology: what becomes of solar energy striking the earth's atmosphere?

That unsolved question, more than any other, has caused differences and uncertainty among various computer programs, called global circulation models, used for climate predictions, such as global warming, Bolton said.

The intended fruits of the $30 million, mainly Pentagon-funded project will be better measurement methods to help scientists more accurately simulate solar energy distribution in the atmosphere, and, in particular, the interactions between sunlight and clouds, he said.

Cloud expert Robert Charlson of the University of Washington in Seattle praised the project although he doubted Bolton's claim of a first.

"It hardly matters whether it was the first time or not," he said. "It's a good thing to utilize such platforms for data that is otherwise rather expensive to acquire."

Besides acting as project coordinator, Sandia/California is in charge of equipping the plane with its instruments and linking them to data receivers, Bolton said. About 20 Sandia employees contribute time to the project, he said.

Across the street at Livermore lab, scientists are creating a laser-based instrument for the project to measure cloud transparency, he said.

But neither lab has worked on the robot plane, which is made by General Atomics of San Diego.

Although Livermore lab is involved with a trio of robot airplanes designed to reach the nearly 70,000 feet altitude ultimately sought by the project, the lab planes don't suit project needs as well as another plane being developed by a private company in Virginia, Bolton said.